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ABSTRACT

The purpose of this project was to specifically identify important works within the National Bureau of Standards library collection of approximately 125,000 items that are generally acknowledged to be pertinent to the development of modern science and technology. Presented is an annotated list including 197 items selected from the pre-1900 holdings in the library. The arrangement is alphabetical by author, and the annotations describe the nature and significance of either the specific publication entry or its author in cases of multiple entries by author. The list provides a general cross-section of the collection and includes important works from the fields of mathematics, physics, electricity, chemistry, mechanics, metrology, and the history of science. (Author/DS)

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An Annotated List of Historically and Scientifically Important Works Published Before 1900 in the Library of The National Bureau of Standards

Janet Terner

September 30, 1977

(Performed pursuant to NBS Purchase Order 712727, July 22, 1977)

SE 033 023

NOTE

The documents in this collection may be consulted at the National Bureau of Standards Library; they are not available through interlibrary loan. Prior arrangements should be made by telephone or mail with the Chief, Information Services, National Bureau of Standards Library, Administration Bldg. E120, Washington, D.C. 20234, 301/921-3451.

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The National Bureau of Standards, because of its long existence and close connection to the basic scientific disciplines and to the development of modern technology, has acquired a rich holding of important American and foreign publications which are significant to the history of science. A preliminary survey of the National Bureau of Standards Library in April 1977 revealed that many important and numerous rare works pertinent to the history of science and technology are contained in library's collection. These have not been previously identified from an historical perspective.

The purpose of this project, conducted between July 22 and September 30, 1977, was to specifically identify important works within the library collection of approximately 125,000 items that are generally acknowledged to be pertinent to the development of modern science and technology. A survey of all pre-1900 holdings in the library, totaling approximately 1200 items and based upon the shelf list catalog,, was undertaken. That survey was the basis from which this report and list was drawn.

The annotated list presented here includes 197 items selected from the pre-1900 holdings in the library. The arrangement is alphabetic by author, and the annotations describe the nature and significance of either the specific publication entry or its author in cases of multiple entries by a specific author. Attempting to characterize the historic significance of the scientific books in the library, this list provides a general cross section of the collection and includes important works from the fields of mathematics, physics, electricity, chemistry, mechanics, metrology and the history of science. Annotations were written with the perspective of the mission of the National Bureau of Standards Library in mind, and were developed from a variety of standard biographic sources, histories of science, and antiquarian rare book lists.

More than 300 items in the pre-1900 holdings of the library are concerned with metrology, its history, and with scientific and institutional documents pertaining to the development of national and international standards. Of these, only a small sampling were selected for this list, and much additional work needs to be done before an accurate picture of the character and historical significance of this sub-collection can be adequately determined.

The total number of entries presented here is an arbitary one, determined more by the limitations of time than by the limitations of important works held by the library. Numerous worthy books could therefore not be included at this time, and the list should perhaps be considered provisional rather than final. Questions about the inclusion or exclusion of certain works are welcome, and hopefully, will in the future advance this list to a more complete and comprehensive accounting.

Respectfully submitted,

Janet Terner, M.S.
Historian of Science
September 30, 1977

QA3.A14 1839

Abel, Niels Henrik, 1802-1829

1. Oeuvres completes de N. H. Abel, Mathematicien, avec des notes et developpements. Oslo, 1839, 2 v.

An outstanding Norwegian mathematician who lived in poverty and died at an early age, Abel did brilliant work in higher mathematics. He also proved the impossibility of solving the general equation to the fifth degree by algebraic methods. The binomial theorem, developed by Newton and Euler, was extended by Abel in a completely general form.

TR592.A15 1895

Abney, Sir William de Wiveleslie, 1844-1920

2. Instantaneous photography. London, S. Low, Marston & Co., Ltd., 1895.

Abney was one of the founders of modern photography. He combined ingenuity, manipulative skill and a scientific approach in addition to a talent for popularization. He pioneered in the quantitative sensitometry of photographic images, invented a dry photographic emulsion technique, and introduced hydroquinone, still one of the best developing agents known. In spectroscopy, he developed a red-sensitive emulsion and with it made the first spectroscopic abalyses of organic molecular structure and the first solar spectrum photographs in the infrared.

QC17.A3 1841

Accademia del cimento, Florence

3. Saggi di naturali esperienze fatte nell' Accademia del cimento. Ed. by G. Gazzeri. 3d ed. Firenze, Tip. Galileiana, 1841, 133p.

The Saggi systematically records the experimental science as practiced by the academicians in Florence, ca. 1684. The Accademia was founded in 1657 as an outcome of the impetus given by Galileo's discoveries to the study of natural science. Advanced for its time, the academicians focused their efforts on physical experimentation, and eschewed the rhetoric typical of scientific theorists in London and Paris. "The Saggi still maintains its position as one of the most influential books to appear in the history of science."--Shipman, Milestones.

QC84.A5 1533 HC

Agricola, Georg, 1494-1555

4. Georgii Agricolae medici libri qvinqve de Mensuris & ponderibus: In quibus pleraq; a Bvdaeo & Portio parum animaduersa diligenter excutiuntur... Basileae, 1533.

The oldest and possibly the rarest item in the library. Agricola (also known as George Bauer) is generally regarded as the "father of mineralogy." He made contributions to such different scientific fields as medicine, mathematics, theology and history, but is most known for his works in mineralogy and mining. He was the very first to rely on direct observation rather than on speculation in the geological sciences. Preceding his classic work, De re metallica, by about 20 years, this is an invaluable work for the history of weights and measures.

34-958

TN617.A27 1563 HC

5. Agricola, Georg, 1494-1555.
Opera di Giorgi Agricola de l'arte de metalli; partita in XII. libri, ne qvali si descrivano tvtte le sorti, e qualita de gli uffizij, de gli instrumenti, della macchine, et di tutte l'altre cose attenenti a cotal arte, non pure con parole chiare, ma eziandio si mettano a luoghi loro le figure di dette cose, ritratte al naturale, con l'aggiunta de nomi di quelle, cotanto chiari, e spediti, che maglio nom si puo desiderare, o hauerre. Aggiugnesi il libro del medesimo autore, che tratta de gl'animali de sotto terra, da lui stesso corretto, e riueduto. Tradotti in lingua toscana da M. Michelangelo Florio Fiorentino. .. Basilea, Per H. Frobenio et N. Episcopio, 1563, 542 p. 6-18921

This early and rare work brings together Agricola's important writings in the metallurgical sciences with his writings in zoology. It was published posthumously.

QA804.A37 1774

Alembert, Jean le Rond d', 1717-1783.
6. Traite de l'equilibre et du mouvement des fluides. 1774.

This work was first published in 1744 when the author was twenty-seven years old, and is a companion volume to D'Alembert's landmark work in the development of mechanics, Traite de dynamique (1743). In the latter, he developed a principle as simple and as fundamental for the motion of bodies as is the principle of virtual velocities for their equilibrium. He applied this principle to the theory of the motion of fluids in the above work. D'Alembert is also known for his association with Diderot in the preparation of the Dictionnaire Encyclopedique.

QC517.A63 1883

Ampere, Andre Marie, 1775-1836

7. Theorie mathematique des phenomenes electrodynamiques, uniquement deduite de l'experience, par Andre-Marie Ampere. 2d ed. Paris, A. Hermann, 1883, 164p. $100 GS 19-224

The second edition of Ampere's great work first published in 1826. It was the experiments described in it which founded the science of electric currents in motion, which Ampere named "electrodynamics." He also introduced the term "electrostatics" for the older study of stationary electric charges. Clerk Maxwell called Ampere "the Newton of Electricity," and in his honor it is now conventional to measure the quantity of electric current passing a given point in a given time in amperes, a usage originated by Kelvin in 1883.

QC631.A55 1826 HC

8. Description d'un appareil electrodynamique... 2d. ed. 1826.

Q113.A6 1889

Andrews, Thomas, 1813-1885

9. The scientific papers of the late Thomas Andrews..London and New York, Macmillan, 1889.

A professor of chemistry at Northern College in Belfast, Andrews is known for his important work regarding the liquifaction of gases. He suggested that for every gas there was a temperature above which pressure alone could not liquify it. This temperature he called the critical point. This discovery pointed the way toward the liquefaction of the permanent gases by demonstrating the necessity of dropping the temperature below the critical point before exerting pressure.

QC102.A5 1769 HC

Anville, Jean-Baptiste Bourguignon d', 1697-1782

10. Traité des mesures itineraires anciennes et modernes. Paris, 1769.

D'Anville contributed greatly to the renaissance of geography and cartography in 18th century France. His Traité is an important study of ancient measurements.

QA825.A6 1892

Appell, Paul (-Emile), 1855-1930.

11. Lecons sur l'attraction et la fonction potentielle... 1892.

Mathematician and physicist, Appell maintained an amazing career combining teaching, research, editing and public service. His researches were in analysis, function theory, infinitesimal geometry and rational mechanics. His scientific work consists of a series of brilliant solutions of particular problems.

QH521.A8 1899

Atwater, Wilbur Olin, 1844-1907, and Francis Benedict

12. Experiments on the metabolism of matter and energy in the human body...Washington, 1899, 112 p.

Agricultural chemist, physiologist and scientific administrator, Atwater was appointed chief of the Agriculture Department Office of Experimental Stations, where he exerted considerable influence on the development of agricultural research in the U.S. Along with E. B. Rosa, he designed and constructed the Atwater-Rosa calorimeter, and studied metabolism as a problem in physiology and to determine improved dietary standards for the working class. Calorimetric work became very popular in the first decade of the 20th century. Atwater's greatest contribution was organizational and administrative--especially his efforts to establish scientific standards for experimental station work.

QB65.B18 1892 HC

Ball, Sir Robert Stawell, 1840-1913.

13. An atlas of astronomy. New York, D. Appleton & Co., 1892.

Ball has been called one of the two or three greatest British mathematicians of his generation, but is best known for his popular works on astronomy.

QD501.B23 1897 HC

Bancroft, Wilder Dwight, 1867-1953

14. The phase rule... 1897.

American born, Bancroft trained in Europe under Ostwald and van't Hoff, and ultimately became a longstanding and well regarded professor of chemistry at Cornell. Bancroft strongly encouraged the development of physical chemistry in the U.S. In The phase rule, he collected together, at great effort, and in a systematic manner, the existing knowledge on the phase rule. The book constituted a very important pioneering advance into a domain which was vigorously and fruitfully developed in the U.S. Bancroft also founded the Journal of Physical Chemistry in 1896.

Benoit, Jean Rene, 1844-1922.

Benoit served as the Director of the Bureau Internationale des Poids et Mesures from 1895-1915, and played a large role in the efforts to standardize the units of length, temperature, and electrical resistance in the scientific world. When Benoit arrived at the Bureau in 1891 as assistant director, the Bureau was three years old and its main concern was the preparation of prototype standards units for its member nations. Charged with determining the best methods of measuring lengths, a detailed study of thermal expansion, the various devices for measuring dilation, and the relative merits of different thermometers was undertaken. Once the standard lengths were set up, Benoit played an important role in their verification and in establishing their relation to other standard units such as the English yard. Benoit was also involved in the standardization of the 24-meter Jaderin surveying wires and with the determination of the standard ohm.

NBS holdings: QC537.B4 1885

15. Construction des etalons prototypes de resistance electrque de Ministere des postes et des telegraphes. Paris, Gauthier-Villars, 1885, 80p.

QC101.B4 1896

16. Determination du rapport du yard au metre. Paris, Gauthier-Villars, 1896, 25p.

QC281.B4

17. Etudes sur l'appareil de M. Fizeau pour le mesure des dilatations appartenant au Bureau Internationale des Poids et Mesures. (no date) 74p.

18. Mesures de dilatation et comparaisons des regles metriques. Paris, Gauthier-Villars, 1882?, 1885. 174p.
(From Trauvaux et Memoires Bur. Int. Poid Mesures, tome 2, 1883)

QC281.B42

19. Nouvelles etudes et mesures de dilations par le methode de M. Fizeau. (From: Travaux et Memoires Bur. Int. Poids et Mesures, tome 6, 1888) 196p.

QC101.B47 1889

20. Rapport sur la construction. les comparaisons et le autres operations ayant servi a determiner les equations des nouveau prototypes metriques. Paris, Gauthier-Villars, 1889, 132p. 6-2197 rev.

Bernard, E. QC84.B5 1688

21. De mensuris et ponderibus antiquis libri tres. Oxoniae, E. Theatro Seldonio, 1688. 2d ed.

An important history of weights and measures in antiquity.

HB201.B5 1896 HC

Bernoulli, Daniel, 1700-1782

22. Die Grundlage der modernen Wertlehre... 1896.

This unusual work on value, is the only work in the Library by the great mathematician Bernoulli.

QA273.B52 1899

Bernoulli, Jacques, 1654-1705.

23. Wahrscheinlichkeitsrechnung (Ars conjectandi) von Jakob Bernoulli (1713). Leipzig, W. Engelmann, 1899, 2 v.

German edition of Bernoulli's "classical treatise" the Ars conjectandi (1713). According to Boyer, p. 458, "This is the earliest substantial volume in the theory of probability....The second part of the Ars conjectandi includes a general theory of permutations and combinations...[It offered] the first adequate proof of the binomial theorem for positive integer powers."

QC89.B55 1839

Bessel, Friedrich Wilhelm, 1784-1846.

24. Darstellungen der Untersuchungen und maassregeln... 1839.

German astronomer who directed the new observatory at Königsberg from 1913 until his death. Modern astronomy of precision is essentially Bessel's creation, which inaugurated the modern era of practical astronomy. Best known for his detection of stellar parallax, Bessel also introduced such items as the effective use of the heliometer, the correction for personal equation, and the systematic investigation of instrumental errpr.

QD461.B55 No. 35, 1892

Berzelius, Jöns Jakob, friherre, 1779-1848.

25. Versuch, die bestimmten und einfachen verhältnisse aufzufinden, nach welchen die bestand theile der unorganisichen natur mit einander verbunden sind. 1892.

4-21849

From: Ostwald's Klassiker der Exakten Wissenschaften, No. 35, 1892. First published in 1810 in Ofhandlingar i fysik, and rev. in Annalen der physik, 1811-12.

Berzelius was one of the most influential figures in 19th century chemistry. A most prolific writer, this reprint is one of his important papers in molecular theory. His exacting studies proved the validity of the law of definite proportions. This helped establish Dalton's atomic theory, and Berzelius was later to prepare a list of atomic weights that was the first reasonably accurate one in history. Berzelius also initiated efforts to introduce symbols to describe chemical compounds. By 1830 he was the greatest chemical authority in the world and became the veritable "lawgiver of chemistry." (Ihde, 113)

QB291.B6 1821

Biot, Jean Baptiste, 1774-1862

26. Recueil d'observations geodesiques, astronomiques et physiques., executees par order du Bureau des Longitudes de France en Espagne, en France, en Angleterre et en Ecosse pour determiner la variation de la pesanteur et des degres terrestes sur le prolongement du meridian de Paris...redige par Biot & Arago. Paris, 1821.

Nominated to the Bureau des Longitudes, Biot and Arago undertook an expedition to determine the arc of the meridian in Spain and the Balearic Islands in 1806. This was followed by other geodesic and astronomical expeditions which were reported in the above publication. Biot's most influential work was in the area of optical activity. He was the first to recognize the phenomena of the rotation of the plane of plane-polarized light. Geodesic studies in 1824-25 led Biot to conclude that the weight of a given body is not the same on all points with the same lattitude, nor is its variation uniform along a particular meridian. This work established the necessity of revising the generally accepted simple ellipsoid theory of the earth.

Z5521.B69 1893

Bolton, Henry C.

27. A select bibliography of chemistry, 1492-1902. Washington, Smithsonian Institution, 1893.

Still regarded as an important bibliographic source in chemistry.

Boltzmann, Ludwig, 1844-1906

Boltzmann's important contributions focused on three fields--thermodynamics, electromagnetism, and the kinetic theory of gases. In electromagnetism he was one of the first scientists in Europe to recognize the importance of Maxwell's work, which he then expounded in lectures and a treatise:

28. Vorlesungen über Maxwell's Theorie der Elektrizität und des Lichts. 2 v. Leipzig, 1891-93.

Regarding gas theory, Boltzmann made fundamental contributions to the kinetic theory, especially in regard to viscosity and diffusion, and he introduced the Maxwell-Boltzmann equations governing the change in distribution of atoms due to collisions. This work was largely published in:

29. Vorlesungen über Gastheorie. 2 v. Leipzig, 1896-1898.

Boole, George, 1815-1864.

English-born mathematician who was appointed to the chair of mathematics at Queen's College, Cork. One of his two books on mathematics is:

QA431.B7 1880

30. A treatise on the calculus of finite differences (1860). 3d ed. 1880.

Boole is most famous for his work on mathematical logic and Boolean algebra. He realized the possibility of an algebra of entities that were not in any sense numbers, and that the laws which hold for different types of numbers need not all be valid in a system not applicable to numbers. His system is described in his:

BC135.B71 1854

31. An investigation of the laws of thought on which are founded the mathematical theories of logic and probabilities. 1854. (1st edition)

QA55.B72 1801

Borda, Jean Charles de, 1733-1799.

32. Table trigonometriques decimales. 1801.

After the French revolution, Borda played a leading role in establishing the decimal system of weights and measures, the word "metre" being his. He was closely associated with Delambre and Mechain in determining the arc of meridian on which the standard metre was based.

Boussinesq, Joseph Valentin, 1842-1929

Theoretical physicist who was assigned the chair of physical and experimental mechanics at Paris, he has been called "one of the last figures of classical science in the 19th century." Boussinesq's work in hydraulics was considerable, and with much insight he was able to use a method of legitimate approximation that made it possible to carry out introcate calculations concerning the study of whirlpools, liquid waves, the flow of fluids, the resistance of a fluid against a solid body and the cooling effect of a liquid flow. He also made worthy contributions in mathematics. Holdings of Boussinesq in NBS Library are:

QA300.B65

33. Cours d'analyse infinitesimale, Paris, Gauthier-Villars, 1887-1890.

QA913.B61 1877

34. Essai sur la theorie des eaux courants...In Memoires, Acad. Sciences de l"inst. Nat. de France, 24, 1877.

QC128.B6 1889

35. Lecons synthetiques de macanique generale..(1883) 2d ed?, Paris, 1889.

QA913.B62 1897

36. Theorie de l'ecoulement...des liquides. 1897.

QC89.F8B72 1799 HC

Brisson, Mathurin Jacques (1723-1806)

37. Instruction sur les nouveaux poids et mesures, decretes le 18 germinal de l'an III^{e} (7 avril 1795, vieux style); (1799).

Aside from its historical value to the history of metrology, Brisson is credited with having written the first textbook on physical chemistry. A convert to Lavoisier's new chemistry, he compiled tables of specific gravities which Lavoisier used, and is still useful today. Brisson was professor of physics at the College of Navarre.

QA803.B8 1855

Brougham, Henry Peter, and Vaux

38. Analytical view of Sir Isaac Newton's Principia. London, 1855.

A lucid study of the Principia, which I. Bernard Cohen points out, has "the solid merit of critically reviewing, paraphrasing, and classifying the essentials of the method, demonstrations, and results of that foundation masterpiece of the modern exact sciences." Although "analytic" the work does not require extensive knowledge of advanced mathematics, thus providing the general reader access to the essential methods and principles of Newton's great work.

Bunsen, Robert Wilhelm (1811-1899)

Professor of chemistry at Kassel, Marburg, Breslau and Heidelburg. Possessed of an excellent knowledge of mathematics and physics, Bunsen's inclinations were experimental and inventive. He participated in the development of the Bunsen burner, the spectroscope, the Bunsen electrochemical cell, the grease-spot photometer, the absorptiometer, the actinometer, the effusion apparatus, the filter pump and an ice calorimeter. It has been said of Bunsen: "As an investigator he was great, as a teacher he was greater, as a man and friend he was the greatest." Bunsen's classical researches on the cacodyl radical supported the Radical theory developed by Lavoisier, Berzelius and Liebig, and is reported in his:

QD412.A7B8 No. 27 1891

39. Untersuchungen Über die kakodylreihe. 1891.

Bunsen undertook a careful investigation of photochemical reactions in 1854, and it was found that the amount of chemical change produced was proportional to the quantity of light absorbed, His studies were reported in:

QD601.B94 No. 38 1892

40. Photochemische untersuchungen. 1892.

QC7.C13 1899

Cajori, Florian

41. A history of physics in its elementary branches... 1899.

Still considered a definite source for the history of physics.

QC16.M4C2

Campbell, Lewis, 1830-1908, and William Garnett, 1850-1932

42. The life of James Clerk Maxwell. With selections from his correspondence and occasional writings. 2d ed. London, Macmillan, 1884, 421p.

4-28112

This work remains to this day the standard biography of Maxwell. Includes a biographical outline, a discussion of Maxwell's contributions to science, and a selection of serious and satiric poetry which Maxwell composed. Campbell was a close friend, and Garnett served as Demonstrator of Physics under Maxwell at the Cavendish Laboratory.

Q125.C3 1873 HC

Candolle, Alphonse P. de, 1778-1841.

43. Histoire des sciences et des savants... 1873.

The brilliant Swiss-French botanist Candolle served as professor of botany at Geneva. He launched a monumental 21 volume plant encyclopedia, and introduced Cuvier's system of classification devoting his life to extending and perfecting it. He invented the word taxonomy, and his system of classification remains largely in use to this day. Candolle was also an excellent biographer and he left many notices of great value in the history of science in addition to the above volume.

QD533.C22 Nr. 30

Cannizzaro, Stanislao, 1826-1910

44. Abriss eines Lehrganges der Theoretischen Chemie. 1891. Ostwald's Klassiker der Exacten Wissenschaften, No. 30.

A German edition of Cannizzaro's classical paper of 1858,"Sunto di un Corso di Filosofia Chimica." At mid-nineteenth century, the calculation of molecular weights was still a matter of uncertainty and confusion. Cannizzaro, professor of chemistry at Genoa, Palermo and Rome, succeeded in bringing order out of this chaos, by demonstrating lucidly that Avogadro's hypothesis could be a valid tool for determining the atomic weights of elements.

QC311.C31 1892

Carnot, Sadi N.

45. Betrachtungen über die bewegende kraft des feuers... 1892.

German edition of Carnot's only published work, (Paris, 1824) Reflexions sur la puissance motrice du feu.; It established Carnot as one of the most brilliant physical scientists of all time. He discovered the cycle of operations in a heat engine, known as "Carnot's Cycle," and formulated the second law of thermodynamics. He described the principle of reversibility and anticipated Helmholtz in his work on the conservation of energy.

Q113.C3 1879 HC

Cavendish, Henry, 1731-1810

46. The electrical researches written between 1771 and 1781. Edited by James Clerk Maxwell, Cambridge, Cambridge University Press, 1879.

$90

Despite important advances, electricity and magnetism remained mysterious, imponderable fluids late into the 18th century, until quantitative studies were begun to find some method for measuring them.

Cavendish in 1771 showed that no charge was to be found inside a charged conductor. The Electrical Researches contains two of Cavendish's published papers (Phil. Trans., 1771, 1776), together with his considerations on the nature of electrification and also investigations into the mathematical theory of charged conductors.

QA927.C3

Cauchy, Augustin Louis, Baron, 1789-1857

47. Theorie de propagation des ondes a la surface d'une fluide pesant d'une profondeur indefinie. Paris, (1827?)

A leading French mathematician in the field of analysis, Cauchy served as professor of mechanics at the Ecole Polytechnique. A prolific writer, he, along with Gauss virtually created the modern form of complex analysis, and he is credited with introducing rigour into the calculus. Besides mathematics, he wrote many important papers in physics and astronomy and helped establish the undulatory theory of light. In his work on waves in liquids, noted above, he relied upon differential equations and introduced the Fourier tranform, which he independently discovered.

Cayley, Arthur, 1821-1895

Sadlerian professor of mathematics at Cambridge, Cayley, in addition to Boole, Sylvester and others, provided a link in the history of pure mathematics with the development of the algebraic theory of invariance which is fundamentally important in current theoretical physics. Three of Cayley's outstanding contributions were the invention of the theory of matrices, the geometry of space of n dimensions, and his geometric ideas which clarified non-Euclidean geometry. Much of what Cayley accomplished has passed into the mainstream of current mathematics.
NBS holds:

QA3.C3

48. The collected mathematical papers...v 1-13, 1889-1897.

QA343.C3 1876

49. An elementary treatise on elliptical functions. Cambridge, Deighton, Bell & Co.; London, Bell & sons, 1876. 384p. $125

50. Memoires upon quantics, 1854-1878. QA215.C3 HC

ND1280.C53 1859

Chevreul, Michel Eugene, 1786-1889

51. The laws of contrast of colour: and their application to the arts of painting, decoration of buildings, mosaic work, tapestry and carpet weaving...,&c. London, Routledge, Warnes & Routledge, 1859. New 2d ed. 19-4500

Professor in the natural history museum of the Jardin des Plantes, Chevreul made significant discoveries regarding the chemical constitution of soaps and fats. In 1824, he became director of dyeing at the tapestry works in Gobelin, and he began investigating dyeing and color relationships. In 1828-30 he published a 2 volume work, Lècons de chemie applique a la teinture. He then turned to the problem of color contrasts and pinneered in developing laws of color harmonies. His De la loi contraste simultané des couleurs (1839), not only influenced the dyeing industry but provided a stimulus for the impressionistic school of painting.

Chladni, Ernst Florens Friedrich, 1756-1827

Known as the "Father of Acoustics," Chladni, inspired by the works of Euler and Bernoulli, became a pioneer in experimental sound. He studied the torsional vibrations of rods and the longitudinal vibrations of strings and rods, applying the latter to the determination of the velocity of sound in solids. He also measured the velocity of sound in gases other than air by filling an organ pipe with gas and then measuring the pitch of the emitted note. The dust figures formed at the nodes of the vibrating plates Chladni studied are called "Chladni figures,"and the laws of acoustics he formulated have never been challenged. Chladni, who was professor of physics at Breslau, published his systematic thesis in German in 1802. It andsubsequent editions in the NBS library are noted below:

52. Die akustik... 1802. QC225,C53 1802
$ 260-300

QC225.C52 1809
53. Traite d'acoustique. Paris 1809. $225
This edition contains an interesting preface of 14 pages describing Chladni's discoveries.

ML2790.C54 1821 HC
54. E. F. F. Chladni's Beytrage zur praktischen akustik...1821.

QC225.C546 1817 HC
55. Neue beyträge zur akustik. Leipzig, Breitkopf und Härtel, 1817.

Classen, Alexander, 1843-1934 QD115.C6 1894

56. Quantitative chemical analysis by electrolysis. 2d English ed. 1894.

Classen's laboratory in Aachen was a center for research on electrolytic analysis. He invented useful apparatus and wrote an important handbook for electrolytic analysis, the English translation of which is noted above.

Clausius, Rudolf, 1822-1888

"The fundamental idea that a gas was an assemblage of moving particles had been put forward by D. Bernoulli in 1738 and Herapath and Joule had in 1851 made a great step in advance by calculating the mean transitional velocity of these particles. This idea, in the hands of Krönig and more especially Clausius (in 1857), gave birth to the modern theory of kinetic gases, which has been so splendidly worked out by Clausius and Maxwell, and since then, perfected in detail by Boltzmann, O. E. Meyer, van der Waals and many others." --Meyer, Hist. Chem., 1898, p. 494. In Clausius' work the second law of thermodynamics is enunciated, and the concept of entropy (a term he coined) is stressed. NBS holds:

QC311.C6
57. Die mechanische wärmetheorie...3 v. 1887-9(original ed. in 1864-67)
$250 17
QC311.C62 1879
58. The mechanical theory of heat. London, Macmillan, 1879.
(English translation of the 2nd and largely revised edition of the Abhandlungen Über die mechanische warmetheorie) $50

QA931.C6 1862

Clebsch, Rudolf Friedrich Alfred, 1833-1872

59. Theorie der Elastizität fester körper. Leipzig, 1862.

Clebsch was an important mathematician who served as professor at the Technische Hochschule in Karlsruhe, the University of Giessen, University of Göttingen, and was also a founder of the Mathematische Annalen. His book on elasticity stemmed from his early career. In it he treated and extended problems of elastic vibrations of rods and plates. His interests here were more mathematical than physical, and he soon moved on to pure mathematics where he achieved a dominant place.

QA846.C6

Clifford, William Kingdon, 1845-1879

60. Elements of dynamic; an introduction to the study of motion and rest in solid and fluid bodies. London, Macmillan & Co., 1878-1887.
Part 1: 1878, Kinematic.

British mathematician, Clifford is most widely remembered as a popular writer on mathematics and physics whose writings are flavored by highly personal and philosophic overtones. He was important in introducing Riemann's ideas and other writers on non-Euclidean geometry to English mathematicians. Clifford expressed his own originality in his papers on biquaternions, the classification of loci, and the topology of Riemann surfaces.

QC91.C72

Commission des Poids et Mesures, 1793

61. Signatures of the original metric committee. Also signatures of the Commission Internationale du Metre members who witnessed the original document 72 years later.

Coulomb, Charles Augustin de, 1736-1806. QC516.C85 Nr. 13 1890

62. Vier abhandlungen über die elecktricität und den magnetismus. Leipzig, 1890, 88p. 3-19266

Note: From Ostwald's Klassiker der Exakten Wissenschaften, Nr. 13. The articles origially were published in Histoire et memoires de l'Academie Royale des Sciences, 1785-1786..

Beginning his career as a military engineer, Coulomb moved toward scientific experimentation. In 1777 he invented a torsion balance which measured the quantity of a force by the amount of twist it produced in a thin, stiff fiber. Applying this invention to electricity for the purpose of improving the mariner's compass, he discovered in 1785, that the force of electrical attraction or repulsion is proportional to the product of the charges on each sphere and inversely proportional to the square of the distance between the spheres, center to center. This meant that electrical forces obeyed a rule similar to gravitational forces, and is called Coulomb's law. The coulomb, the unit for the quantity of electric charge, was named in his honor. This 1890 publication reprinted Coulomb's classic reports of 1785 and 1786.

QC513.C85 1897

Curry, Charles Emerson.

63. Theory of electricity and magnetism. With a preface by Ludwig Boltzmann. London, New York, Macmillan, 1897, 442p. 47-36326 $140

A good restatement in English of Boltzmann's theory in electricity and magnetism. Boltzmann wrote: "Dr. Curry thought that (my book of lectures on electricity and magnetism) translated into English might be useful... and offered a more elaborate treatise...inserting my lectures as well as the theory of Hertzian oscillations, Maxwell's equations for moving bodies, etc."

QE372.D23 1892

Dana, James Dwight, 1813-1895

64. The system of mineralogy of James Dwight Dana, 1837-1868. Descriptive mineralogy, 6th ed. New York, Wiley, 1892.

A graduate of Yale, then assistant to Benjamin Silliman, Dana published his first edition of the System of mineralogy (1837) when he was 24 years old. He spent the next four years as geologist and mineralogist on the Wilkes expedition which explored the South Pacific. His reports of the zoology and geology of the coral islands are classics. Later, he served as professor of natural history and geology at Yale. His System of mineralogy went through five editions.

QB28.D3 1821a

Delambre, Jean Baptiste Joseph, 1749-1822

65. Histoire de l'astronomie moderne. Paris, 1821.

In this classic work, Delambre analyzed the writings of the major astronomers such as Descartes, Galileo, Copernicus, and Keppler, as well as giving accounts of certain minor but significant astronomers, reference to whom is rarely found in other works. According to I. Bernard Cohen, "there is hardly a subject treated by Delambre...on which the scholar will not find important insights and valuable information. ...Delambre's work remains the most useful work of its kind ever written."
It was Delambre who proposed the new unit of measure, the metre, based upon the 10-millionth part of an arc drawn through Paris from Dunkirk to Barcelona (1798-99).

QA273.D37 1756 HC

DeMoivre, Abraham, 1667-1754

66. The doctrine of chances: or, a method of calculating the probabilities of events in play. 3d ed. London, A. Millar, 1756, 348p. $225

A French mathematician who adopted England as his home for the last 66 years of his life, DeMoivre achieved recognition in his own lifetime for his contributions to algebraic calculations, the science of life-contingencies and life-expectancies. Todhunter called this work on probabilities, "the most important contribution to the theory of probability before the 19th century." The 3d edition was much enlarged over earlier ones, the first edition in 1718, and the 2d edition in 1738. DeMoivre's work on probability was superceded and overshadowed by Laplace's great synthesis.

QA273.D38 1838

De Morgan, Augustus, 1806-1871.

67. An essay on probabilities and their application to life contingencies and insurance offices. London, Longman, Orme, Brown & Green & Longmans, 1838, 306p.
6-5370

De Morgan, a mathematician who held the chair in mathematics at the University College, London, was a prolific writer who exerted considerable influence on the development of mathematics in the 19th century. He was a great teacher and also made original contributions in the fields of analysis and logic. Subsequent developments in symbolic logic owes much to his fundamental work in logical research. De Morgan was also a powerful advocate of decimal coinage. His Essay on probability, written for an encyclopedia, is regarded as a standard work in the theory of probability and is still cited in the insurance literature.

BL245.D7 1896

Draper, John William, 1811-1882

68. History of the conflict between religion and science. 1896.

Draper came to the U.S. from England in 1833, and received his M.D. from the University of Pennsylvania in 1836. He practiced as a physician in Virginia and New York. He also served as professor of chemistry at William and Mary College and soon after at Hampden Sidney College, becoming then the first professor of chemistry in the newly founded New York University Medical College. A pioneer of photography in the U.S., his researches in chemistry were numerous, original, and valuable; his earlier History of the intellectual development of Europe (1852), is still regarded as an authoritative work. Draper's History of the conflict between religion and science(1874) was his most popular work, widely read in many translatranslations. It offered a vigorous polemic against the persecution of scientists by religionists.

Q113.D7 1878

Draper, John William, 1811-1882.

69. Scientific memoirs: being experimental contributions to a knowledge of radiant energy. New York, 1878. $100

First collected edition which contains Draper's important early papers "Examination of the radiation of red-hot bodies" (1847), "On invisible fixed lines in the sun's spectrum detected by photography" (1843), and other related papers on the negative rays of the sun, the diffraction spectrum, the decomposition of carbonic acid gas by plants, on daguerretype, lunar photography, the chlorhydogen photometer, microscopic photography, electro-motive power of heat, etc.

QC518.D8 1894

Drude, Paul Karl Ludwig, 1865-1906

70. Physik des aethers...1894.

As a physicist, Drude became convinced that Maxwell's electromagnetic theory was superior to the older mechanical view of light. This led to his Physik des aethers (1894) which was one of the first German books to base explanation of electrical and optical effects on Maxwell's theories.

Duhem, Pierre Maurice Marie, 1861-1916

Duhem, a French physicist, was an unusual and noteworthy scientist who made important contributions in science (especially thermodynamics, hydrodynamics, and physical chemistry) and in the philosophy of science and the history of science. Despite his accomplishments, Duhem was never offered a professorship or chair at a major university owing to personal and professional conflicts. His work in thermodynamics extended and elaborated on the pioneering work of Gibbs and Helmholtz and introduced their knowledge of chemical thermodynamics to a whole generation of French physicists and chemists. His Potential thermodynamique (1886) is historically important for the systematic use of thermodynamic potentials, when others were still using osmotic pressure as a measure of chemical affinity. His book on hydronamics had an important influence on mathematicians and physicists, and he is regarded as a lone pioneer who for years tried to provide rigorous general theorems for Navier-Stokes fluids and for finite elasticity in Kelvin-Kirchoff-Neumann bodies. His works at NBS include:

QC311.D8 1895

71. Le potential thermodynamique et ses applications a la mecanique chimique et l'etude des phenomenes electriques. Paris, A. Hermann. 1895 ed.

QC20.D8 1891

72. Hydrodynamique, elasticite, acoustique. 1891

QC311.D83 1896

73. Theorie thermodynamique de la viscosite...1896.

QD261.D8 1898

74. Manuel operatoire de chimie organique...1898.

QA308.E8

Euler, Leonhard, 1707-1783.

75. Supplemente und Zusätze zur Integralrechnung. 1830.

Euler, the great Swiss mathematician who spent most of his career at St. Petersburg, was the creator of modern mathematical expression, and one of the most outstanding mathematicians and astronomers of his century. Euler's contributions range over the entire field of pure and applied mathematics. His researches on series led to his creation of the theory of definite integrals by the development of so-called Eulerian integrals. The above work was published first in 1794 as a supplement to his great textbook, Institutiones calculi integralis (1768-1770).

Michael Faraday, 1791-1867

English physicist and chemist, Faraday was one of the most famous and ingenious scientists of the 19th century. Among his contributions are: the liquification of chlorine, the isolation of benzene, and the discovery of certain chlorides and compounds of carbon, iodine and hydrogen. In 1831 he began his studies in electricity and magnetic forces. He discovered magnetic induction and was the first to use the concept of magnetic lines of force and to provide an explanation for what he called the dielectric constant. His conception of electric and magnetic forces and their interrelations were essential to the direction taken by science thereafter, especially since Maxwell developed his equations based upon them. Faraday also demonstrated the existence of five sorts of electricity, and formulated the basic laws of electrolysis, introducing many terms now universally used. Faraday is also credited with the discovery of the rotation of the polarization plane of light, Important works by Farady at NBS are:

Q113.F21 1859 HC

76. Experimental researches in chemistry and physics. London, 1859 ($175)

In this work, Faradays important discoveries in chemistry and physics ranging from 1821 to 1857 are presented.

QC503.F2

77. Experimental researches in electricity. London, 1839-1855. 3 v. $325

On the Grolier List of 100 Books Famous in Science, it contains his classic electromagnetic researches.

QC71.F24 1860 HC

78. A course of six lectures on the various forces of matter...1860.

QD161,F21 1853 HC

79. The subject matter of a course of six lectures on the non-metallic elements.

Faraday was renowned for his great skill as a lecturer

QA32.F5

Fibonacci, Leonardo, fl. 1220

80. Scritti di Leonardo Pisano... Roma, Tipografia delle scienze matematiche e fisiche, 1857-62. 2 v.

Leonardo of Pisa, or Fibonacci, was educated in Barbary where he became acquainted with al-Khwarizmi's Algebra and the Arabic numeral system. With his return to Italy, he published his Liber Abbaci (1202, rev. 1228), and is credited with introducing Arabic mathematical science into Europe. The mathematical masterpiece of the Middle Ages, it remained a standard for more than two centuries. In this work can also be found the so-called Fibonacci series 1, 1, 2, 3, 5, 8, 13, 21..etc., in which each term is the sum of the two preceding terms. The Liber Abbaci is included in this 19th century reprint of Fibonacci's great works, as well as his Practica Geometrica (1225), which introduced a large amount of material on geometry and trigonometry, presumably from Greek sources now lost.

Fleming, Sir John Ambrose, 1849-1945

Fleming, an electrical engineer who had worked with the Edison Company in London and then became professor at University College "was one of the leading teachers of his time. His flair for linking together the mathematical bases of little-understood phenomena with their practical effects was a factor which drew many distinguished engineers to his special lectures at University College as well as...at the Royal Society of Arts." --DNB. In 1890, he began studying the "Edison Effect" which led in 1904 to his invention of the thermionic valve, which ultimately made radio broadcasting possible. Two of Flemings works are in the collection:

QC601.F59 1899

81. The centenary of the electric current...1899.

QC601.F6 1898

82. Magnets and electric currents. An elementary treatise for the use of electrical artisans and science teachers. London, E. & F. N. Spon, 1898.

Fourier, Jean Baptiste Joseph, baron, 1768-1830.

The first of the French mathematical physicists, Fourier was awarded an appointment at the Ecole Normale and later, a chair in the Ecole Polytechnique. Beginning in 1807, Fourier examined the flow of heat in solids and developed a new method of mathematical analysis of the process. His studies were published in 1822 as the Theorie analytique de chaleur. Of this work, Maxwell wrote that it "was the first and greatest book on the physical subject of the conduction of heat. It is one of the very few scientific books which can never be rendered antiquated by the progress of science." The development of Fourier analysis marked "an epoch in the history of mathematical physics."--Cajori. Held by NBS are:

QC254.F56 1878

83. The analytical theory of heat. Translated by Alexander Freeman. Cambridge, The University Press, 1878, 466p. 46-39765 $110
--First edition in English

QC254.F56 1888

84. The analytic theory of heat. New York, Stechart, 1888.
--presumably the first American edition

85. Oeuvres de Fourier...1888-90. QC3.F77

QC351.F7

Fresnel, Augustin J., 1788-1827

86. Oeuvres Completes. Paris, Imprimerie Imperiale, 1866-1870. 3 v. First and only collected edition. $200

Fresnel served as a government engineer for years before he began his experimental researches in 1815. Fresnel discovered the principle of interference without being aware that Young had achieved this more than 13 years earlier. To remove objections to his theory, Fresnel designed his memorable experiment which produced two small sources of light without resorting to apertures or edges of opaque obstacles. By using two plane metallic mirrors, forming an agle nearly 180° with each other, he avoided diffraction and yet produced interference with the reflected beams. In the Oeuvres completes can be found the experiments and mathematical proofs that make Fresnel the creator of the wave theory of light.

Note: vol. 1 missing; replaced with 1965 reprint.

QC123.G15 Nr. 11, 24, 25

Galilei, Galileo, 1564-1642

87. Unterredungen und mathematische deonstrationen über zwei neue wissenszweige... 1890-91,

A German translation and reprint (Ostwald's Klassiker series?) of Galileo's great work on mechanics, Conversations and mathematical demonstrations on two new branches of science (1638). It constituted the most notable progress in mechanics since Archimedes, and throughout the work, Galileo depended on the results of experiments rather than speculation.

BF412.G2 1875

Galton, Sir Francis, 1822-1911

88. English men of science: their nature and nuture. London, Macmillan & Co., 1874, 270p. 10-20467

Galton investigated the families of great men and suggested that genius was hereditary. His works founded the science of eugenics, though the term itself was not coined until 1883. Galton was a proponent of Darwinism, and he devoted much time and effort to support his view with statistical evidence.

Gauss, Karl Friedrich, 1777-1855

German mathematician, astronomer and physicist, Gauss has been ranked, along with Archimedes and Newton, as one of the greatest mathematicians of all time--the "prince of mathematicians." He enriched mathematics in a large variety of ways, and, in many respects, set the pace for the expansion of mathematical research in the 19th century. His most profound discoveries in mathematics were achieved between the age of fourteen and seventeen. In 1795, he discovered the method of least squares, of which two editions are noted below, In 1801, he published the Disquisitiones Arithmeticae, usually considered his greatest achievement. Equally prolific in astronomy and geodesy, he computed the orbit of planetoids, published in his Theoria motus (1809), and developed formulas for calculating parallax. In 1818, he was commissioned to make a geodesic survey to the Kingdom of Hanover, which led to his invention of the heliotrope. After 1831, he took up fundamental research in electricity and magnetism, invented the bifilar magnetometer, and was honored with the naming of the electromagnetic unit, the gauss. His works in NBS include:

QA275.G2 1887 HC

89. Abhandlungen zur methode der kleinsten quadrate...1887.

QA275.G27 1855

90. Methode des moindres carres...1855.

QA3.G3

91. Carl Friedrich Gauss Werke,.. 1870-
(--bd. 2, bd., 4, bd. 5 only)

QD181.I1G3 No. 4
1889 HC

Gay-Lussac, Joseph Louis, 1778-1850

92. Untersuchungen über das jod. 1899. Ostwald's Klassiker/Exakten Wissenschaften, der Nr. 4. Originally published as"Memoire sur l'iodide," Annals de chemie, 1814

French chemist who served as professor of chemistry at the Ecole Polytechnique and later at the Jardin des Plantes, Gay-Lussac is distinguished for his work on laws of gases and the properties of iodine and cyanogen. In 1808 he published his most influential work, the law of combining gas volumes, which proved crucial to consolidating atomic theory. Although iodine was discovered in 1811 by B. Courtois, it was Gay-Lussac who brought about an understanding of this element and gave it the name iode (from the Greek ioeides meaning violet colored). A considerable controversy surrounded Gay-Lussac's work with iodine because Humphrey Davy challenged him on the priority of his work.

Gibbs, Josiah Willard, 1839-1903.

Born in New Haven, where he spent almost his entire life, Gibbs was one of America's greatest scientists. He is responsible for much of the basic work in modern chemical thermodynamics and statistical mechanics. Appointed professor of mathematics at Yale, Gibbs, and his great contributions in thermodynamics remained almost unknown until Maxwell, in 1875, recognized his work. His early papers in mathematics, physics, and thermodynamics, were all published in the Transactions of the Connecticut Academy of Sciences between 1873-1878. His great importance rests on his comprehensive application of mathematics to chemical subjects, which was unrivaled in his day. NBS has his:

QC311.G5 1892 HC

93. Thermodynamische studien...transl. by Wilhelm Ostwald. Leipzig, 1892. $385

First German edition of Gibb's three papers on thermodynamics. Before him, the sciences of thermodynamics comprised only the relabetween heat and mechanical work. Owing to Gibbs, thermodynamics was broadened to include the whole field of energy transformations between all the forms in which it may be manifested--thermal, mechanical, electrical, chemical, or radiant.

QD501.G4 1899 HC

94. Equilibre des systems chimiques...1899.

QC751.G46 1893 HC

Gilbert, William, 1544-1603.

95. William Gibert of Colchester; On the loadstone and magnetic bodies, and on the great magnet of the earth. Transl. by P. Fleury Mottelay. New York, Wiley & Sons, 1893, 368 p. 4-1294

The first English translation of Gilbert's classic work on magnetism. Today, the unit of magneto-motive force is called the gilbert.

Glaisher, James, 1809-1903

British meteorologist, largely self-taught, who served as superintendent of the magnetic and meteorological department at Greenwich. He effectively organized meteorological observations and climatological statistics in the United Kingdom.

QC886.G5 1867

96. Diurnal range tables, newly arranged; containing corrections for temperature, adapted to different hours of observation, for different ranges of daily temperature... 4th ed. London, Taylor & Francis, 1867.

QC886.G52 1880

97. Table of corrections for temperature.. 2d ed. London, Taylor & Francis.

Glaisher, James Whitbread Lee, 1848-1928

Son of James Glaisher, he was an astronomer and mathematician who was interested in the calculation of numerical tables. He served on the Committee on Mathematical Tables, which issued a 175-page report containing much historical and bibliographical data, published in 1873. He has been called "a mathematical stimulus to others rather than a pioneer."

QA51.G53 1879

98. Factor table for the fourth million....1879

QA51.G54 1880

99. Factor table for the fifth million....1880

QA51.G55 1883

100. Factor table for the sixth million...1883.

Glazebrook, Richard Tetley, 1854-1935

British physicist who became secretary of the British Association Committee on Electrical Standards in 1883, and then served as director of the National Physical Laboratory when it was established in 1913. An accomplished experimentalist, as NPL director he pressed for the determination of fundamental units for both scientific and industrial purposes. He wrote several textbooks which were widely used:

QC255.G5

101. Heat and Light...Cambridge, 1894.

QC127.G52 1895

102. ...Mechanics, an elementary textbook. 2d ed. 1895.

Grashof, Franz, 1826-1893

Grashof's career focused on applied mechanics, thermodynamics and machine design. In 1854 he became director of the Office of Weights and Measures at the Gewerbe-Institut, and was a founding member of the Verein Deutscher Ingenieure, and later became its director. He was recognized as an authority on mechanical engineering and was regarded as an outstanding teacher and engineer who influenced a generation of engineers that followed him. The Grashof Medal is named for him and awarded annually for achievment in technology. He also served on the Standards Commission.

TJ145.G7

103. Theoretische maschinenlehre. 3 v. Leipzig, 1875-90.

This work was characterized by sharp insight and critical observation regarding the limits of accuracy and the admisibility of assumptions, and was without peer in the literature.

QC191.G7 1878

104. Theorie der elasticität und festigkeit...Berlin, 1878.

In his work, for the first time, were presented the fundamental equations of the theory of elasticity. In this text on the strength of materials he treated flexure, torsion, bucking, plates and shells.

QD905.G88 1876 HC

Groth, Paul Heinrich von, 1843-1927.

105. Physikalische krystallographie. Leipzig, 1876.

Groth's most important contribution to science was his explanation of the connections between chemical composition and crystal structure. In this work can be found his investigational findings on the optical, thermal, elastic, magnetic and electrical properties of crystals. Many of his views on morphotropy and isomorphism, and on chemical crystallography in general have become firmly embedded in the chemical literature.

Guillaume, Charles Edouard, 1861-1938

After obtaining his PhD, Guillaume entered the Bureau Internationale des Poids et Mesures. He remained there throughout his career and became its director in 1915. His first work was devoted to thermometry, resulting in his Etudes thermometriques (1886), and his Traite pratique de la thermometrie de precision (1889), the latter becoming a standard work for metrologists. He then participated in the preparation of the national meters, a fundamental work which marked the origin of modern metrology. After 1890, Guillaume took up his investigations on metal alloys, especially the ferronickels and obtained an alloy, invar, that was widely employed because of its non-expansive qualities. He also discovered elinvar, an alloy whose elasticity does not vary with temperature. In 1920, Guillaume received the Nobel Prize for his work on ferronickels. NBS holds his:

QC271.G82 1886 HC
106. Etudes thermometriques. 1886

QC101.G8 1893
107. Rapport sur l'etude des metaux propres a la construction des regles etalons. Paris, Gauthier-Villars, 1893.

QC271.G8 1889 HC
108. Traite pratique de la thermometrie de precision. Paris, Gauthier-Villars, 1889.

QC100.G8 1893
109. ...Unites et etalons. P-ris, Gauthier-Villars, 1893, 190p. 40-2567

Guldberg, Cato Maximilian, 1836-1902 QD501.G97 Nr. 104 1899
QD501.G97 Nr. 104 1899
110. Untersuchungen Uber die chemischen affinitäten. 1899. Ostwald's Klassiker der Exakten Wissenschaften, Nr. 104.

Along with P. Waage, Guldberg is known for his "Law of Mass Action." Beginning with their first paper on chemical equilibrium in 1864, Guldberg and Waage developed mathematical expressions that cover both forward and reverse chemical reactions, and cited some 300 quantitative experiments as evidence of the manner in which mass, concentration, and temperature affected reaction rates. Their brilliant work remained almost unknown until Wilhelm Ostwald adopted the law of mass action and proved its validity by new experiments (1877). Guldberg's and Waage's papers on mass action have been abridged and translated into the above work.

QA55.H351 1830 HC

Hassler, Ferdinand Rudolf, 1770-1843

111. Logarithmic and trigonometric tables; to seven places of decimals, in a pocket form. New York, C. & G. & H. Carvill, 1830.

These tables are notable because their author is a major figure in the history of American metrology. Born in Switzerland, he emmigrated to the U.S. in 1805. A geodesist and mathematician, he became the first superintendent of the United States Coast Survey, the first scientific bureau under the government. While engaged in obtaining instruments for the Coast Survey, Hassler, being one of the leading metrologists in his day, devoted considerable attention to securing standards of weights and measures for the government.

QC21.H38 1806 HC

Hatly, Rene-Just, 1743-1822

112. Traite elementaire de physique. 2 v. 2d ed. Paris, 1806.

After writing his Essay on the theory and structure of crystals (1784) which laid the foundation for the mathematical theory of crystal structure, Hauy was ordered by Napoleon to write a textbook on physics. This book, (first edition, 1802), was outstanding for its clear, methodical exposition of physics.

Heaviside, Oliver, 1850-1925

QC503.H53 1892

113. Electrical papers. 2 v. London, 1892.

Heaviside is recognized as the founder of the theory of cable telegraphy and discoverer of the "heaviside layer" in the upper atmosphere. Beginning in the 1870's, he wrote technical articles including proposals for multiplex telegraphy. His contributions to telegraphy theory had significance far beyond their immediate technical importance. He introduced self-induction, impedance and conductance notions, and regarded telegraphy, whether by cable or by radio-waves, as being essentially the same.

QA406.H55

Heine, Heinrich Eduard, 1821-1881

114. Handbuch der kugelfunctionen, theorie und anwendungen. 2d ed. 2 v. Berlin, 1878-81.

Mathematician Heine's greatest work, its treatment of spherical functions (legendre polynomials) became the standard compendium on the subject well into the 20th century.

QC101.H62 1863 HC

Herschel, John Frederick William, 1792-1871.

115. The yard, the pendulum and the metre...1863.

Mathematician, physicist and astronomer, Herschel is perhaps best renowned for his astronomical contributions. In 1850, curiously following in Newton's footsteps, Herschel became Master of the Mint. There he advocated decimal coinage, and wrote articles on metrology, physical georgraphy and the telescope. The above work in metrology came from this last period in his life.

Hertz, Heinrich Rudolf, 1857-1894

Professor of physics at Karlsruhe, Hertz's great fame rests upon his experimental proof of the Faraday-Maxwell hypothesis that electrical waves can be projected through space. He also demonstrated that electric waves are essential the same as light waves. They travel in straight lines with the same velocity as light waves; they can be reflected and refracted; they are subject to interference and can be polarized. His work was not only scientifically significant but it also entitled him to be regarded as a pioneer of radio communication. Works of Hertz at NBS are:

QC3.H49

116. Gesammelte werke. 1894-95. 3 v.

QC3.H5 1896

117. Miscellaneous papers, ed. by P. Lenard. London, 1896.
This volume contains 19 technical papers published between 1880-1892.

QA805.H57 1899

118. The principle of mechanics presented in a new form. London, 1899.
Hertz's last major work, published posthumously in 1894, this is the first English edition. Following Helmholtz's investigations, it discusses the various forms of energy and the conditions of transmission from one form to another. The preface contains much biographical data.

QD511.H58 Nr. 9 1890

Hess, Germain, 1802-1850.

119. Thermochemische untersuchungen...1890. Ostwald's Klassiker der Exakten Wissenschaften, Nr. 9.

A pioneer in thermochemistry, Hess established (1838-40)the law of constant heat summation (Hess's Law), which states that the heat developed in a chemical change is constant, whether the change occur in one or in several stages. This, in fact, is a consequence of the conservation of energy principle, but at the time the principle had not been clearly formulated. Hess's contributions have been reprinted in the above edition.

Hoff, Jacobus Hendricus van't, 1852-1911.

Van't Hoff was a pioneer of stereochemistry and the theory of solutions, and one of the greatest chemists of his day. His work on solutions resulted in the Nobel Prize in 1901. His works at NBS include:

QD481.H694 1898

120. The arrangement of atoms in space. 2d rev. & enl. ed., London, New York, Longmans, Green, 1898. $175

First published in 1875, this is the work on which the whole science of stereochemistry was largely based. Van't Hoff reasoned that substances which show optical rotation do so because of the asymetric structure of their molecules.

QD453.H69

121. Lectures on theoretical and physical chemistry. 1899-1000.

QD191.H7 1897

122. Vorlesungen über bildung und spaltung von doppelsalzen. 1897.

QD1.J6

123. Jahresbericht über die fortschritte der chemie.

Founded in 1822 by Jons Jakob Berzelius, this annual review was famous and esteemed. In it Berzelius reported his own significant findings, and brought attention to important research published elsewhere. Berzelius was shrewd in judging scientific work and had a rare insight into the significance of observations made by others.

QC3.J6

Joule, James Prescott, 1818-1889.

124. The scientific papers of James Prescott Joule. 2 v. London, 1884-1887.

Joule is celebrated for his experimental establishment of the mechanical theory of heat. In 1841 - 1849 he published several papers establishing theoretically and experimentally the mechanical equivalent of heat. In 1848 Joule wrote his epoch-making paper on the kinetic theory of gases, containing the first estimate of the velocity of gas molecules. Of Joule, Lord Kelvin remarked, "his boldness in making such large conclusions from such very small observational effects is almost as noteworthy ...as his skill in extorting accuracy from them."

QA300.J8

Jordan, Camille, 1838-1921

125. Cours d'analyse. 3 v. 1882-1887.

Regarded as a 'universal" mathematician, who published in practically all the branches of math, Jordon's conception of rigourous proof in analysis was far more exacting than that of most of his contemporaries. His Cours d'anlyse had a widespread influence and set the standard which was not surpassed for many years.

QB981.K16 nr. 12
1890 HC

Kant, Immanuel, 1724-1804.

126. Allgemeine naturgeschichte und theorie des himmels...1890. (Ostwald's Klassiker der Exakten Wissenschaften, no. 12)

The great philosopher's cosmological work, Universal Natural History and the Theory of the Heavens (1755), in which he boldly anticipated astronomical facts that were later confirmed by very powerful observational techniques and with the help of relativistic cosmological theory. He conjectured that our solar system is a part of a vast system of stars making up a single galaxy, that the so-called nebulous stars are galactic systems external to but similar to our own galaxy, and that there are many such galaxies in the universe as a whole.

Kelvin, Baron (William Thomson), 1824-1907.

Along with Michael Faraday, Thomson was also responsible for initiating the theory of electromagnetic field. Along with Helmholtz, Thomson contributed to the establishment of the first law of thermodynamics. Reviewing Carnot's work on an ideal heat engine, Thomson established the theoretical absolute temperature scale, the Kelvin scale. In 1851, he ennuciated the second law of thermodynamics, from which considerations, led him to contributions to the theory of chemical equilibrium. From these, and many other important contributions, Thomson came to be known as one of the greatest physicists of the 19th century. Works by Thomson at NBS include:

QA805.K3 1894
127. Elements of natural philosophy. 1894.

Q171.K29
128. Popular lectures and addresses. 3 v. 1889-

QC3.K29
129. Mathematical and physical papers, 1882-1911. 1884-90. (vol. 2 & 3 only)

QC503.K29 1884
30. Reprint of papers on electrostatics and magnetism. 2d ed. 1884.

QA805.K31
131. Treatise on natural philosophy. Cambridge, University Press, 1895-96. 2 v.
--with P. G. Tait

QA465.K4 1615

Kepler, Johannes, 1571-1630

132. Nova stereometria doliorum vinariorum. 1615.

One of the earliest and rarest books in the NBS Library, this work by the great celestial physicist, is generally regarded as one of the significant works in the prehistory of the calculus. He set about to compute the actual volumes of wine casks delivered to his home. Instead of using the classical Archimedian procedures, he adopted a less rigorous but productive scheme in which he considered that the figures were composed of an infinite number of thin circular laminae or other cross sections. Captivated by the task at a time when he was engulfed by personal troubles, he extended his method to other shapes. This book was probably the first book ever published in Linz. This work was later revised as Messekunst Archimedis (1616).

Note: The shelf list entry indicates that this rare work is missing. Efforts might be undertaken to try and locate it.

Kirchhoff, Gustav Robert, 1824-1887.

German physicist, Kirchhoff generalized the equations dealing with the flow of electricity in conductors and developed a theorem that gives the distribution of currents in a network. He also provided a logical synthesis of mechanics which he considered an accurate description of natural phenomena. His work in spectral analysis with Bunsen laid the basis for the science of spectroscopy. With it, they discovered the elements cesium and rubidium. Kirchhoff applied spectroscopic methods to the study of the chemical composition of the stars which resulted in the Kirchhoff law of radiation. It states that the ratios of the emissive to the absorptive powers were the same for all bodies at a given temperature for radiation of a given wavelength. Works by Kirchhoff at NBS include:

133. Vorlesungen über mathematische physik. (Published in 4 volumes)
--I. Mechanik. 4th ed. 1897 QA805.K58 1897
II. Mathematische optik. 1891. QC383.K55 1891
III. Electricität und magnetisimus. 1891 QC518.K6 1891
IV. Theorie der Wärme. 1894. QC254.K5 1894

QD545.K58 1898 nr. 101
134. Abhandlungen über mechanische wärmetheorie. (Ostwald's Klassiker der Exakten Wissenschaften, Nr. 101).

QD95.K58 1895 Nr. 72
135. Chemische analyse durch spectralbeobachtungen. Written with Robert Bunsen and edited by Wilhelm Ostwald. Ostwald's Klassiker der Exakten Wissenschaften, Nr. 72. 1895.

QB551.K58 1862
136. Researches on the solar spectrum. 1862.

QD11.K8 HC

Kopp, Hermann F. M.
Geschichte der chemie. Braunschweig, 1843-1847. Four parts in two volumes.

First edition of the standard history of chemistry, distinguished by its comprehensiveness and thoroughness. It remains a monumental work of learning, patient labor, skill and sagacious criticism.

QA804.L17 HC

Lagrange, Joseph Louis, 1736-1813

138. Mecanique analytique. Nouvelle edition, revue et augmentee par l'auteur. Paris, 1811-1815, 2 v. $225

2d edition. Ernst Mach called this work "a stupendous contribution to the economy of thought." It includes the discovery of the general equations of motion. One of the greatest of French mathematicians, Lagrange set out to dispose once and for all the reasoning necessary to resolve mechanical problems by embodying them as much as possible in a single formula.

Lambert, Johann Heinrich, 1728-1777

Lambert did pioneering work in pyrometry in addition to his studies on light absorption. He rediscovered the principle that the fraction of incident light absorbed by a medium is proportional to the thickness of the medium.

QC253.L25 1779 HC

139. Pyrometrie; oder, vom maasse des feuers und der wärme. Berlin, 1779.

QC391.L22 1892

140. Lamberts photometrie. 1892. 3 v.

Laplace, Pierre Simon, Marquis de, 1749-1827.

Laplace's mathematical genius was discovered early and at the age of 20 he was appointed professor at the Ecole Royale Militaire. His greatest contributions were in the fields of celestial mechanics and the calculus of probabilities. For a time, he served as a member of the Commission des Poids et Mesures. His work on probability calculus is remarkable. The major work was his Theorie analytique des probabilitzés (1812), a splendid exposition, without any intervention of mathematics, of the principle and application of the geometry of chance. His other significant work in this field is his Essai philosophique sur les probabilitzés. (1814). NBS possesses editions of both works:

QA273.L3 1816
141. Essai philosophique sur les probabilitzés. 3d ed. Paris, 1816.

QA273.L3 1840 HC
142. Essai philsophique sur les probabilitzés. 6th ed. 1840

QA273.L34 1886 HC
143. Théorie analytique des probabilitzés. 3d ed. Paris, Gauthier-Villars, 1886.

QA241.L49 1808
Legendre, Adrien Marie, 1752-1833

144. Essai sur la theorie des nombres. 2d ed. Paris, Courcier, 1808, 480p. $125

Legendre, like Laplace, was a mathematical genius, but because of "his timidity and Laplace's unfriendliness toward him, few important offices commensurate with his ability were tendered to him. As an analyst, second only to Laplace and Lagrange, he enriched mathematics by important contributions. The gem in this work is the theorem of quadratic reciprocity, previously indistinctly given by Euler, but herein clearly enunciated and partly proved. This law was called by Gauss the "gem of arithmetic."

Lejeune-Dirichlet, Peter Gustav, 1805-1859.

Friend and disciple of Gauss, Dirichlet amplified the latter's classic work, Disquisitiones arithmeticae (1807). He is also credited with the "marvelous theorem...that every arithmetic progression, a, a+b, a+2b, a+3b, a+4b,...etc., in which a and b are integers with no common divisor greater than 1, contains an infinity of primes."--Bell, p. 237. His works at NBS include:

QA3.L42
45. G. Lejeune Dirichlet's werke. 2 v. 1889-97.

QA241.L55 1894
146. Vorlesungen Uber zahlentheorie. 4th ed. 1894.

QD305.A2L7 1891

Liebig, Justig, 1803-1873

147. Abhandlung: Über die constitution der organischen säuren. Liepzig. 1891. Ostwald's Klassiker der Exakten Wissenschaften, Nr. 26.

This is a reprint of Liebig's important work on organic acids reported in 1837-38. In his search for an understanding of organic acids, Liebig resurrected the ideas of Davy and Dulong on the role of hydrogen in acid, and concluded that acids are hydrogen compounds in which the hydrogen may be replaced by metals.

Mach, Ernst, 1838-1916.

Works by the great Austrian physicist and philosopher include:

QC252.M2 1896
148. Die principien der warmelehre...1896.

QC225.M3 1873
149. Optische-akustische versuche...1873.

QA802.M15 1893
150. The science of mechanics. Chicago 1893.
The first English edition of Mach's great work Die mechanik und ihrer entwicklung (1883).

QP461.M3 1872 HC
151. Zur theorie des gehörorgans...2d ed. 1872.

GC11.M45 1860

Maury, Matthew Fontaine (1806-1873)

1[illegible] The physical geography of the sea. 8th ed. 1860.

The eighth edition of the first major textbook of modern oceanography (1st ed--1855). On the Grolier List of 100 Books Famous in Science. For the first time, in this work, the sea was viewed as the subject matter for a distinct scientific discipline. In it, Maury described the general extent of the ocean surfaces, the forms of coast lines, the ocean tides and currents, the physical and chemical conditions of sea water and the various organisms that inhabit the oceans. Includes sketch of the first section of the first map of the floor of the North Atlantic Ocean. An officer in the U.S. Navy and Superintendent of the Depot of Charts and Instruments of the U. S. Navy Department, he was responsible for the adoptation of the uniform system of recording oceanographic data for the naval vessels and merchant marine of the entire world. The first edition is valued at more than $150.

Maxwell, James Clerk, 1831-1879

One of the greatest physicists of the 19th century, Maxwell took the experimental studies of Faraday concerning electric and magnetic fields and stated them in exact mathematical form. In 1864, he predicted that electromagnetic waves could be produced, and were so discovered by Hertz in 1887. Maxwell's studies also led to his famous conclusion that light waves are electromagnetic in nature and not mechanical. In 1871 he published his Theory of heat, and in 1873 his Treatise on electricity and magnetism which became the foundation of modern electromagnetic theory. Maxwell's works at NBS include:

QC518.M44 1888
153. An elementary treatise on electricity. 2d ed. Oxford, 1888.
--written for the non-mathematical student

QC495.M37 1857 HC
154. Experiments on colour. 1857

QC3.M5 1890
155. Scientific papers. 2 v. 1890.
Included are his papers on physics, mathematics, electromagnetism, kinetic theory, and matter

QC255.M48 1899
156. Theory of heat. 1899,

QC518.M47 1873 HC
157. A treatise on electricity and magnetism. 2 v. Oxford, Clarendon, 1873.
First edition. One of the most oustanding books in science.

QC518.M47 1892
158. A treatise on electricity and magnetism. 3d ed. 1892,
the final version of this great text.

QB291.M48 HC

Mechain, Pierre Francois Andre, 1744-1805

159. Base du systeme metrique decimal...1806-10.

Mechain, along with Delambre, undertook an expedition to determine the standard length based on calculations of the measurement of a meridian arc extending from Dunkirk to Barcelona. They reported their findings in 1798 and the final metre was established from which three platinum standards and several iron standards were produced.

Mendeleev, Dmitrii Ivanovich, 1834-1907.-

Mendeleev, who accomplished much important work in physical chemistry and metrology, also contributed important theories of the nature of solutions and the origins of petroleum. His chief claim to fame rests upon his brilliant work creating the periodic law of the elements,

QC107.M44 1898 HC

160. Kalebaniia viesov... 1898.

QD31.M53 1891 HC

161. The principles of chemistry. 5th ed. London, New York, Longmans, Green, 1891.
--the periodic law included as an appendix.

QC175.M6 1899

Meyer, Oskar Emil, 1834-1909.

162. The kinetic theory of gases. 1899.

Professor of physics at Breslau, Meyer's experimental work contributed to the final formulation of the kinetic theory of gases by Clerk Maxwell in 1871. This book is an attempt to make the new molecular theories available to a wider circle of audiences, especially chemists and naturalists who are less familiar with mathematics. Translated from the German.

Meyer, Lothar, 1830-1895

German chemist who independently and almost simultaneously with Mendeleev discovered the periodic law of the elements. Mendeleev's system was more elaborated than Meyer's and became the accepted system of periodicity. The germ of Meyer's idea on periodicity can be found in his earliest edition of Modern theories of chemistry, but it was not explictly stated until 1870, shortly after Mendeleev's announcement. At NBS can be found the following works by Meyer:

QD467.M61 Nr. 66 1895
163. Die anfänge des natürlichen systems der chemischen elemente. 1895. Ostwald's Klassiker der Exakten Wissenschaften, nr. 66

QD463.M4 1883
164. Die atomgewichte der elemente aus den originalzahlen neu berechnet. Leipzig, Breitkopf and Härtel, 1883, 245p.

QD453.M62 1888
165. Modern theories of chemistry. translated from the German 5th edition. 1888.

Michelson, Albert Abraham, 1852-1931.

Michelson was awarded the Nobel Prize in physics for "his optical precision instruments and for the spectroscopic and metrological investigations made with them." While on leave from the University of Chicago to work at the International Bureau of Weights and Measures at Sevres (1892-93), Michelson showed that the standard of length could be replaced by reference to a specific wavelength of light, one found in the cadmium spectrum. This made possible a new natural physical standard of higher precision and one of universal reproducibility. Michelson, along with E. W. Worley, had discovered previously (1887) that the measured velocity of light in space is constant no matter what the motion of the observer or the source may be. At NBS two of Michelson's works are available:

QC101.M62 1894 HC
166. Determination experimentale de la valeur du metre...1894.

QC407.M6 (photocopy)
167. Experimental determination of the velocity of light. 1882?

QD157.M67 1897 HC

Moissan, Henri (1852-1907)

16. Le Fluor electrique. Paris, 1897, 385 p., with 42 figures in text. $115

First Edition, considered rare. "The original edition of the book on the electric furnace, invented by the author, which made electrolytic industry possible and is in use at the present time."--Duveen, p. 408. In 1892, Moissan created the electric arc furnace for the purpose of obtaining very high temperatures for experimental work. It enabled him to prepare many new compounds--carbides, silicides and bromides--and melted and volatized substances which had previously been regarded as infusible. He was awarded the Nobel Prize in 1906 in chemistry --"for his research on the isolation of the element fluorine and for placing at the service of science the electric furnace which bears his name."

Mouton, Gabriel QB41.M93 1670

169. Observationes diametrarum solis. Luduni, Ed typographia M. Liberal, 1670.

In 1670, Mouton, a scientist in Holy Orders at Lyon, proposed a linear scale based on a geodetic minute of arc decimally divided. Mouton's plan was discussed for almost 100 years before the progress of commerce and science called for more rational measures than the weights and measures then in common usage.

Newton, Sir Isaac, 1642-1727

Two valuable editions of Newton's revolutionary books are at NBS:

QA803.N4 1729 HC

170. The mathematical principles of natural philosophy. Translation into English by Andrew Motte. London, 1729 $700

QC353.N56 1730

171. Opticks: or, a treatise on the reflections, refractions, inflections and colours of light. 4th ed. London, W. Innys, 1730.

QC3.03 1892

Ohm, Georg Simon, 1787-1854

172. Gesammelte abhandlungen... 1892.

Director of the Polytechnique School of Nürnberg, and professor at the University of Munich, Ohm's most important work was his Die galvanische Kette mathematisch bearbeitet (1827), in which he presented a precise formulation of the notion of electro-motive force. It further established the relation between electro-motive force and electric current. He also introduced the idea of resistance of the conductor which came to be known as Ohm's law. His work greatly influenced the theory of electricity and its applications.

QD453.086 1891 HC

Ostwald, Wilhelm, 1853-1932

173. Solutions. Being the fourth book, with some additions, of the second edition of Ostwald's "Lehrbuch der Allgemeine Chemie," translated by M. M. Pattisen Muir. London, 1891. $100

First English edition.

One of the chief founders of modern physical chemistry, Ostwald won the Nobel Prize in 1909 for his work on catalysis. His "Lehrbuch" from which this translation was extracted was, in its time, the greatest textbook in chemistry.

Planck, Max Karl Ernst Ludwig, 1858-1947

Throughout a long and active career, Planck's main interest lay in thermodynamics. In his Vorlesungen uber thermodynamik (1897) are four of his most important papers dealing with the principle of the increase of entropy. This concept led Planck to his derivation of the correct radiation formula and his concept of the "quantum of action," now recognized as perhaps the most fundamental of the universal constants. In 1918, Planck received the Nobel Prize for Physics.

QD511.P7 1893

174. Grundriss der allgemeinen thermochemie..1893

QC311.P74 1897 HC

175. Vorlesungen über Thermodynamik. Leipzig, Veit & Co., 1897.
--First edition of his classic work.

Poggendorffs, Johann Christian, 1796-1877.

Z7404.P74

176. J.C. Poggendorffs biographische-literarisches handwörterbuch...Leipzig, 1863-

A most valuable resource for the history of science. It provides biographical information, and is a unique tool for identifying and tracing scientific papers published before 1900.

Poincare, Jules Henri, 1854-1912

Considered one of the greatest mathematicians of the late 19th century, Poincare used mathematics as a tool to investigate the planets, the tides, electricity and light. He served as professor at the University of Paris. His works at NBS include:

QC183.P75 1895

177. Capillarite...1895.

QA805.P74 1899

178. ...Cinematique et mecanisms...1899.

QB351.P75

179. Les methodes nouvelles de la mecanique celeste. 1892-99. 3 v.

QC321.P75 1895

180. Theorie analytique de la propagation...1895

QC661.P75 1894 HC

181. ...Les oscillations electriques...1894.

QA925.P75 1893

182. ...Theorie des tourbillions.. 1893.

QA825.P75 1899

183. Theorie du potential Newtonien. 1899.

QC355.P75 1892

184. ...Theorie mathematique da la lumiere II. 1892.

QC311.P75 1892 HC

185. ...Thermodynamique. 1892.

QD181.A6R3 1896 HC

Rayleigh, John William Strutt, Baron (1842-1919), and William Ramsey (1852-1916)

186. Argon, a new constituent of the atmosphere. Washington, Smithsonian institution, 1896, 43 p.

$135

The first American edition of the classic work announcing the discovery of argon. The discovery was the unexpected outcome of investigations into the density of oxygen and nitrogen. Lord Rayleigh received the Nobel Prize for Physics in 1904 for this work, the most important consequence of which was that it led to the discovery of helium. Ramsey received the Nobel Prize in chemistry in 1904 for his discovery of the presence of other inert gases with argon.

QC223.R266 1880

Rayleigh, John William Strutt, Baron, 1842-1919.

187. Die theorie des schalles. 1880.

German edition of the Theory of sound (London 1877-1878, 2 v.). The only textbook ever written by Lord Rayleigh, it addresses dynamical questions of resonance and vibrations both of gases and of elastic solids. The treatment is mathematical. At once this work assumed the rank of the leading book on the subject, a position it has retained.

Rome de l'Isle, Jean Baptiste Louis de, 1736-1790.

QC84.R6 1789 EC

188. Metrologie, ou tables pour servir a l'intelligence des poids et mesures des anciens...Paris, 1789, 214p.

A valuable history of metrology by the French mathematician.

QC481.T47 1896

Thompson, Edward P.

189. Roentgen rays and phenomena of the anode and cathode: Principles, Applications, and theories. New York, 1896.

$100

"A very early work on Roentgen rays,"--Walter Alvarez. An American pioneer in radiology, Thompson, along with Thomas Alva Edison and F. W. Magie of Princeton, are described by A. Evans, as having done the "most original and enduring work" in America, on the Roentgen rays.

QC518.T48 1895

Thomson, Joseph John (1856-1940)

190. Elements of the mathematical theory of electricity and magnetism. 1st ed. Cambridge, 1895, 510p.

"His textbook...has probably moulded the ideas of many generations of students in these matters, outside of those who were privileged to hear the living voice"--Rayleigh: Sir J. J. Thomson (1942)

191. Elements of the mathematical theory of electricity and magnetism. 2d ed. Cambridge, at the University Press, 1897, 508p.

QC518.T48 1897

"I have also made a few verbal alterations in the hope of making the argument clearer in places where experience has shown that students found unusual difficulties." --Preface.

QC518.T5 1893

192. Note on recent researches in electricity and magnetism. Intended as a sequel to Professor Clerk-Maxwell's Treatise on electricity and magnetism. Oxford, 1893.

$115

This volume marked the first account in English of the discharge of electricity through gases. Thomson was concerned with consolidating the status of electromagnetic theory that had been left by Clerk Maxwell, and deals mainly with the solution of various electrical problems of great mathematical difficulty. Thomson was awarded Nobel Prize in 1906 "for his theoretical and experimental investigations into the transmission of electricity through gases."

QC925.T48 1883 HC

193. A treatise on the motion of vortex rings. 1883.

For this essay, J. J. Thomson was awarded the Adams Prize at the University of Cambridge.

TA475.T78 1824

Tredgold, Thomas, 1788-1829.

194. Practical essay on the strength of cast iron, and other metals...containing practical rules, tables and examples: founded on a series of new experiments, with an extensive table of the properties of materials. 2d ed., enl. & improved. London, J. Taylor, 1824, 307p. Approx. $100

Beginning his career as an apprentice cabinet-maker, then joiner and journeyman carpenter, Tredgold studied architecture and engineering. His work was the first serious attempt in England to determine practically and scientifically the data of resistance. This work was a standard textbook for English engineers for a long time.

QC89.U5A32 1790 HC

U. S. Dept. of State

195. Report of the secretary of State, on the subject of establishing a uniformity in the weights, measures and coins of the United States. N.Y., 1790, 49p.
10-6985

In this historically important document, Jefferson, then Secretary of State, presented to Congress a plan for establishing uniformity in the coinage, weights and measures. He proposed a system whereby the measures and weights and coins "will be derived altogether from mechanical operations, viz.: a rod vibrating seconds...subdivided and multiplied...for every measure of length, surface and capacity, and these last filled with water to determine the weights and coins..."

Vega, Georg, freiherr von, 1754-1802

QA55.V4 1856 Eng.

196. Logarithmic tables of numbers and trigonometrical functions. Transl. from the 40th ed. 1856.

English translation of Vega's most complete and important work (1797), the Tabulae logarithmico-trogonometricae. Based on Adriaen Vlacq's Arthmetica Logarithmica (1628), it provides a more compendius arrangement of the table of the logarithms of numbers. There are tables of arcs of a circle, a comprehensive collection of trigonometric formulas, and Wolfram's hyperdic logarithms of primes.

Whewell, William

Q125.W55 1857

197. History of the inductive sciences. 3d ed. 3 v. 1857. $70

First published in 1837, this work established Whewell as a high authority among the scientific writers of his day. Indispensible for the student of the history of science.